PUBLISHED

PRODUCT ENGINEERING

MONTHLY

INDEX TO VOLUME XIX

JANUARY to DECEMBER 1948

McGraw-Hill Publishing Company, Inc., 330 West 42nd St., New York 18, N. Y.

ALPHABETICAL INDEX

EDITORIALS

We cannot afford scientific bankruptcy ..... Jan. 79
The urgency for lower cost designs .. Feb. 79
He created a masterpiece ..... Mar. 79
Promoting the profession among students ..... Apr. 79
Only experience can guarantee performance ..... May 79
Human factors in design programs .. June 79
Engineering to assure peace ..... July 79
No substitute for sound thinking ..... Aug. 79
Management sorely needs engineers ..... Sept. 79
Design expense or creative investment ..... Oct. 79
Standards that can't be measured .. Nov. 79
Designs based on surveys ..... Dec. 79

SPECIAL SECTIONS

Motor driven machines ..... Mar. 113
Experimental stress analysis ..... Apr. 113
Electrical wiring for motor driven machines ..... May 113
Patents and the engineer ..... pt. I June 113, pt. II July 113
Plastics as engineering materials .. Sept. 129
Plain sleeve bearings ..... Oct. 129
(See Classified Index)

—A—

Accelerations by vector methods in disk cam mechanisms ..... Dec. 128
Adjustable blade fan ..... May 95
Adjustable speed drive, why consider ..... Dec. 81
Adjustable-voltage control system .. Feb. 127
Age-hardening nickel alloys ..... Oct. 126
Air blast limits material flow ..... Dec. 95
Air compressor ..... Mar. 99
Air conditioner control ..... Oct. 97
Air force research funds spent in civilian organizations ..... Nov. 149
Air motor, lightweight rotary ..... July 98
Air motors, crankless compressed .. Nov. 95
Air traffic control systems for safer flying (abstract) ..... Feb. 137
Aircraft accessory systems ..... Nov. 119
Aircraft instrument design ..... Aug. 121
Alignment assured by split link ..... Sept. 101
Alkyd resists tracking when exposed to arcs ..... Nov. 133
Allocation of steel speeded ..... Nov. 149
Alloys for high creep strength (abstract) ..... Jan. 132
Alloys need new design concepts, light ..... July 81
Aluminum alloy sheet, engineering characteristics of 61S ..... June 108
Aluminum determined by color of coating, effects of overheating ..... July 104
Aluminum extensively used in smallest turbo-jet ..... May 148
Aluminum propeller blades and hub, extruded ..... Dec. 127
Aluminum widely used in German industry ..... Jan. 157
Amplifier control insensitive to vibration ..... Nov. 128
Analysis of press performance ..... Oct. 81
Applying special small motors for powering engineered products ..... Jan. 144
Applying the polariscope ..... Nov. 124
Applying torsion bar springs ..... Oct. 104
Arbor press ..... May 100
Automobile brake adapted from airplane design ..... Oct. 167
Automotive heater ..... Jan. 99
Axle unit for truck trailers, tandem .. Aug. 96

—B—

Backlash considerations when designing gears ..... July 108
Ball and roller bearings ..... Feb. 123
Ball bat marker ..... June 100
Ball bearing seals and internal and external slinger rings ..... Oct. 110
Ball valve, Venturi ..... June 103
Bearing load, NBS finds straight line relation for estimating safe ..... Nov. 148
Bearing selection ..... Mar. 149
Bearings and lubrication for high-speed machinery ..... Dec. 108
Bearings, ball and roller ..... Feb. 123
Bearings, plain sleeve (special section) ..... Oct. 129
Correction ..... Nov. 150
Bearings with diminishing oil supply, journal ..... Nov. 104
Belt conveyors, feeders, takeups, drives and idlers for ..... Aug. 114
Bending members, overstrength of short ..... Nov. 110
Beryllium reduces porosity of many materials ..... Dec. 136
Bimetal, thermostatic ..... Sept. 106
Blower control unit, variable speed .. July 100
Blower wheel ..... Jan. 106
Brazing by induction heating, designing for silver ..... Aug. 109
Brazing methods affect design of details, how ..... Apr. 86
Bread wrapper ..... Jan. 100
British progress toward motor vehicle gas-turbine ..... July 149
Brittle coating .. pt. I June 86, pt. II July 133
Bronze coating doubles life of steel gears ..... Dec. 112
Brushes for constant electrical resistance, slip rings and ..... June 129
Bulldozer, 750 horsepower ..... Nov. 90

—C—

Cabinet design, economics of ..... Nov. 139
Cadmium, adhesion of enamel finishes to electroplated (abstract) ..... Dec. 138
Calculator for guided missle computations, mechanical ..... Nov. 151
Camera aids high speed studies, fastest ..... Mar. 161
Cam mechanisms, accelerations by vector methods in disk ..... Dec. 128
Cams, high accuracy contour ..... Aug. 134
Cast crankshafts (abstract) ..... Aug. 126
Casting, precision investment ..... Apr. 81
Casting process licensed to American foundry, British ..... Oct. 165
Casting steel continuously ..... Oct. 161
Cavitation erosion, selecting alloys to resist ..... Jan. 110
Cellulosic plastics ..... May 85
Reference book sheet ..... May 153
Centrifugal friction clutches, pivoted ..... Feb. 140
Ceramics, high temperature ..... Mar. 110
Chain saw ..... Mar. 102
Chain, tensile and elasticity testing of steel roller ..... Sept. 121
Chains by plating after assembly, embrittlement of roller ..... Sept. 105
Characteristics and configurations of reinforced plastic joints ..... pt. I May 104, pt. II June 134
Chart for determining properties of round aircraft tubing ..... Sept. 165
Charts for calculating root stresses in spur gears ..... Feb. 161
Charts for designing long-short addendum spur gears ..... Mar. 167
Chromium, physical properties of electrodeposited (abstract) ..... July 137
Cigarette merchandiser ..... June 92
Circuits, metallized ..... Apr. 141
Clutch, magnetic fluid ..... May 145
Clutch, non-repeat safety ..... Dec. 97
Color of coating, effects of overheating aluminum determined by ..... July 104
Compression tester ..... June 151
Compressor housing ..... Feb. 103
Consumer products, neglected factors in the design of ..... Aug. 81
Contact ratio charts for designing spur gears ..... Apr. 167
Contrasting colors for metal templates ..... Aug. 124
Control system, adjustable-voltage .. Feb. 127
Control system, master ..... May 109
Control systems, positioning (abstract) ..... Sept. 157
Conveyor chain links and joints, trolley ..... Jan. 122
Cooling jacket, tube ..... Sept. 100
Cork, fungicide for ..... June 107
Coupling, high capacity eddy current ..... Nov. 96
Couplings for shafts, flexible ..... Feb. 90
Creating new products, engineering responsibilities in ..... Sept. 81
Creep rate of various industrial leads (abstract) ..... Mar. 146

Creep tester .....May 96
Cures for the troubles of the patent office .....Nov. 102
Curie temperature alloys.....June 158

— D —

D-C power sources for machine tools (abstract) .....Sept. 154
Deadlock, automatic .....Dec. 101
Design of structural components for interchangeability .....Aug. 137
Designing for low scrap to reduce cost Apr. 150
Designing for shock resistance.....Jan. 140
Designing for silver brazing by induction heating .....Aug. 109
Designs and operating principles of pumps .....
pt. I Feb. 118, pt. II Mar. 108, pt. III Apr. 144
Designing for die casting.....Oct. 86
Designing with dollars .....Mar. 81
Determining dimensional relationships in complex parts .....Dec. 133
Die casting, designing for.....Oct. 86
Die casting machine.....Jan. 102
Die truck .....May 101
Dimensional relationships in complex parts, determining .....Dec. 133
Dimensioning practice (abstract)...Oct. 123
Directory of commodity specifications expands .....Oct. 128
Double enveloping right angle gear drives .....Aug. 85
Dough mixer, variable ratio and speed for .....Oct. 102
Drill feed controlled by heated wires Aug. 101
Drill press turret, self-aligning.....July 101
Drilling machine .....Nov. 98
Drive mechanism, ingenious (abstract) Aug. 125
Drives for planers, electric (abstract) May 129
Dry cleaning machine.....Apr. 92
Dry printing process operates electrostatically .....Dec. 122
Dynaflow transmission, Buick.....Feb. 96
Dynamometer for small motor measurements, precision (abstract)....May 132

— E —

Economics of cabinet design.....Nov. 139
Economics of radio frequency heating Jan. 118
Effects of overheating aluminum determined by color of coating.....July 104
Electric light controls street lights..Dec. 142
Electric power and American industry (abstract) .....Sept. 156
Electrical laminated cores, resin bonding of silicon steels in.....Nov. 85
Electrical wiring for motor driven machines (special section).....May 113
Electrodeposited chromium, physical properties (abstract) .....July 137
Electrodeposited copper-tin alloy (abstract) .....May 133
Electroforming difficult shapes.....Dec. 86
Electroforming parts with high strength (abstract) .....Mar. 145
Electrogyro vehicle .....Mar. 103
Electroless plating (abstract).....May 130
Electronic bin level indicator.....June 99
Electronic calculator to solve industrial and scientific problems.....Mar. 160
Electronic micrometer uses dual coils (abstract) .....Jan. 134
Electroplate, thickness standards for cadmium .....June 165
Electroplate, thickness standards for nickel .....Jan. 163
Electroplate, thickness standards for zinc .....June 167
Embrittlement of roller chains by plating after assembly.....Sept. 105
Engine test control.....Jan. 104
Engineering characteristics of 61S aluminum alloy sheet .....June 108
Engineering developments in 1947..Feb. 81
Engineering profession, growth and influence of .....May 81
Engineering responsibilities in creating new products .....Sept. 81
Engineering scheduling and control Dec. 102
Evaluating the ideal industrial instrument finish .....May 134
Expansion chamber, exhaust system July 97
Experimental stress analysis (special section) .....Apr. 113
Exposure meter, plastic .....May 98
Extruded aluminum doors .....June 95
Extruded aluminum propeller blades and hub .....Dec. 127

— F —

Fastener has stamped components..June 97
Fastest motion pictures ever made..Apr. 164
Feeders, take-ups, drives and idlers for belt conveyors .....Aug. 114
Finish application table.....Jan. 161
Finishes for electroplated cadmium, adhesion of enamel (abstract)....Dec. 138
Fire-resistant hydraulic fluid developed for aircraft .....Dec. 144
Fire-retardant paints .....Aug. 140
Flange type seals for ball and roller bearing applications .....Nov. 122
Flanged joint for welded tubular steel structures .....Nov. 117
Flexible couplings for shafts .....Feb. 90
Flexural strength and stiffness of wood-aluminum sandwich panels....Aug. 104
Flowmeter, two element.....Dec. 000
Fluid pressure drop losses through smooth straight tubing.....Sept. 117
Forgings, toughness of (abstract)..Jan. 136
Formed parts for heavy construction, hot pressed .....Nov. 113
Formed parts, rotary contour.....Oct. 117
Formula reduces number of variables involved in creep.....Sept. 163
Formulas for involute curve layouts..Aug. 145
Formulas for spring redesign.....Apr. 143
Correction .....July 184
Four-bar linkages and typical industrial applications .....Dec. 106
Four station electric resistance heater Sept. 90
Frequency calculations, natural....Aug. 155
Fundamentals of noise.....
pt. I Feb. 131, pt. II Mar. 87, pt. III Apr. 137
Fungicide for cork.....June 107

— G —

Gaging element, worm sectioned....July 96
Gases and vapors flowing through pipes, pressure drop of.....July 151
Gas-turbine, British progress toward motor vehicle .....July 149
Gating systems for metal casting (abstract) .....Aug. 129
Gear contact ratios, graphical determination of .....Mar. 152
Gear drives, double enveloping right angle .....Aug. 85
Gear motors based on unit design...June 153
Gear tooth inspection method as an index of performance .....Feb. 87
Gear trains for multiple speeds.....Feb. 144
Gears, charts for calculating root stresses in spur .....Feb. 161
Gears, charts for designing long-short addendum spur .....Mar. 167
Gears, contact ratio charts for designing spur .....Apr. 167
Gears, design factors for reduction (abstract) .....Dec. 137
Germans used oxygen to make ferrous alloys .....Jan. 151
Germany extrudes brass shapes.....Nov. 109
Glass for high light intensity, heat resistant (abstract) .....Feb. 139
Graphical determination of gear contact ratios .....Mar. 152
Graphical representation of the Johansson system of machining tolerances Oct. 169
Greases, high temperature .....Jan. 93
Greyhound highway traveler.....Aug. 92
Grinding machine uses cam to control cycle .....Aug. 103
Growth and influence of the engineering profession .....May 81

— H —

Hack saw, modified Scotch yoke drive for .....Nov. 93
Hard metals uses (abstract).....Nov. 151
Heating, economics of radio frequency Jan. 118
Heat of food (abstract) .....May 131
Heliarc welding for the different-to-weld metals and alloys.....Jan. 127
Helical spring transducer stretches coil by coil .....Nov. 149
High accuracy contour cams.....Aug. 134
High pressure vessels designed with wound construction .....Oct. 85
High temperature ceramics .....Mar. 110
High temperature greases .....Jan. 93
Highly stressed structures, testing..Nov. 81
Hill-holder for passenger cars.....Aug. 152
Hot pressed formed parts for heavy construction .....Nov. 113
Hot water heating system.....Sept. 94
How brazing methods affect design of details .....Apr. 86
Hydraulic connecting rod .....Mar. 95
Hydraulic control for sprinkler system Dec. 94
Hydraulic control system, high pressure Sept. 93
Hydraulic power unit.....Jan. 107
Hydraulic pump, compact high pressure July 102
Hydraulic shock absorber orifice designs and equations.....
pt. I Feb. 92, pt. II Apr. 146
Comment .....Nov. 184
Hydraulic surface grinder.....Feb. 104
Hydraulic system .....Apr. 95
Hydraulic system testing.....Dec. 119

— I —

Induction heating, designing for silver brazing by .....Aug. 109
Injection molding costs (abstract) Nov. 150
Injection molding machine.....Mar. 96
Instrument finish, evaluating the ideal industrial .....May 134
Instrument gives sand moisture content July 95
Insulating and magnetic materials, properties (abstract) .....Mar. 147
Insulators used to control and amplify electric current .....July 146
Interchangeability, design of structural components for .....Aug. 137
Involute curve layouts, formulas for..Aug. 145
Iron alloy machine parts, strain testing improves .....Aug. 116
Iron and steel review.....
Jan. 117, Feb. 116, Mar. 107, Apr. 109 May 108, June 106, July 4, Aug. 7, Sept. 3, Oct. 3, Nov. 3, Dec. 3

— J —

Jack, two-speed mechanical.....Nov. 94
Japanese magnetic materials not made in U. S. .....Jan. 121
Jet engine components, test laboratory for .....Nov. 150
Jet steel data.....Dec. 146
Johansson system of machining tolerances, graphical representation of Oct. 169
Journal bearings with diminishing oil supply .....Nov. 104

— L —

Laminates, comparison of low pressure (abstract) .....Jan. 137
Laminates, aircraft plastic (abstract) Dec. 140
Laminates, thermosetting (abstract) Apr. 157
Laminating and coating, continuous (abstract) .....June 140
Leak detector .....Oct. 99
Lenses, metal microwave.....June 148
Light alloys need new design concepts July 81
Lightweight salvage pontoon.....Dec. 144
Linkages, four-bar .....Dec. 106
Liquid rheostat design (abstract)..June 139
Locomotive gas turbine disclosed in development stage .....May 147
Loom, high speed cam operated.....July 92
Losses through smooth straight tubing, fluid pressure drop.....Sept. 117
Lubricating system, transmission gear Oct. 96
Lubrication for gear systems, methods of providing .....July 106
Lubrication for high-speed machinery, bearings and .....Dec. 108

— M —

Machine tool show, British.....Nov. 152
Magnesium alloy for high temperature application (abstract).....Apr. 153
Magnesium alloy progress (abstract) Mar. 148
Magnet stability, permanent .....
pt. I Nov. 129, pt. II Dec. 113
Magnets of sintered oxides, permanent Feb. 120
Magnetic filter unit.....May 103
Magnetic latching of relays.....Apr. 110
Magnetic separator for dry materials Aug. 100
Man-carrying rocket-jet aircraft....Jan. 150
Marker, high speed.....Oct. 98
Master control system .....May 109
Metallized circuits .....Apr. 141
Metal finishing process information sheets .....
pt. I Nov. 163, pt. II Nov. 165, pt. III Dec. 159
Metal stamping designs for economy in production .....Sept. 122
Meter adjustment, precision thread for frequency .....Dec. 96
Methods of providing lubrication for gear systems .....July 106
Metric system, adopt the (abstract) Sept. 153
Mica splitter developed at Bureau of Standards, mechanical .....Mar. 163
Micro-wave research tower.....July 144
Motion analysis, percentage charts for Oct. 171
Motorcycle has stamped frame....July 103
Motor driven machines (special section) Mar. 113
Motor driven machines, wiring for (special section) .....May 113
Motor has aluminum housing.....May 101
Motor, lightweight rotary air.....July 98
Motors and controls for textile machinery (abstract) .....Nov. 148
Motors based on unit design, gear..June 153
Motors for powering engineered products, applying special small.....Jan. 144

— N —

Natural frequency calculations.....Aug. 155
Navy magnifies time.....Aug. 147
Neglected factors in the design of consumer products .....Aug. 81
Nickel alloys, age-hardening.....Oct. 126
Noise, fundamentals of.....
pt. I Feb. 131, pt. II Mar. 87, pt. III Apr. 137

Engineering Library

Nonferrous metals review..... Jan. 115, Feb. 116, Mar. 105, Apr. 107 May 107, June 105, July 2, Aug. 5 Sept. 3, Oct. 3, Nov. 3, Dec. 3
Nomograph for designing high speed V-belt drives .....Dec. 155
Nomograph for the square root of the sum of the squares.....Nov. 161
Nomogram for designing steel torsion springs .....Sept. 167
Non-destructive test methods.....July 129
Non-destructive thickness gaging by x-ray successfully applied.....Mar. 158
Nonferrous metal powders.....Sept. 102
Nonferrous powdered metal parts...Oct. 107
Notch toughness of steel plates....Feb. 110
Nuts and bolts, safety devices (abstract) .....July 140
N.Y.U. maintains contact with industry July 142

—O—

Oil well pumping system.....Feb. 106
Operating characteristics of industrial solenoids...pt. I July 86, pt. II Aug. 130
Overstrength of short bending members Nov. 110

—P—

Paints, fire-retardant .....Aug. 140
Paper cutter, hydraulic operation..Sept. 98
Paper punch has welded stampings.Sept. 96
Patent office, cures for the troubles of Nov. 102
Patents and the engineer (special section).....pt. I June 113, pt. II July 113
Peacetime benefits from military research .....Jan. 81
Percentage charts for motion analysis Oct. 171
Perforating machine .....Mar. 100
Permanent magnet stability pt. I Nov. 129, pt. II Dec. 113
Permanent magnets of sintered oxides Feb. 120
Photoelastic investigation of stress-relieving fillet curves .....May 138
Pipe bending machine, largest.....Sept. 160
Piston assembly machine.....Oct. 92
Pivoted centrifugal friction clutches.... Feb. 140
Plain sleeve bearings (special section) Oct. 129
Bearing performance factors....Oct. 130
Design concepts .....Oct. 131
Bearing types .....Oct. 132
Engine bearings—requirements..Oct. 134
Engine bearings—materials.....Oct. 135
Engine bearings — current design Oct. 139
Porous bearings .....Oct. 145
Wood bearings .....Oct. 147
Carbon-graphite bearings.....Oct. 147
Correction .....Nov. 150
Cast iron and steel bearings....Oct. 148
Plastic laminate bearings.....Oct. 149
Rubber bearings .....Oct. 151
Hydrodynamic bearings .....Oct. 152
Plastic housing, scale has three-piece Aug. 98
Plastic joints, characteristics and configurations of reinforced..... pt. I May 104, pt. II June 134
Plastic laminates, thermosetting, pt. I Dec. 123
Plastic light fixtures, acrylic (abstract) Oct. 122
Plastic parts simplify vacuum cleaner Oct. 94
Plastic resists high heat and corrosion Oct. 106
Plastic viewer .....Apr. 103
Plastics as engineering materials (special section) .....Sept. 129
Redesign of circuit breaker....Sept. 130
Colored plastic spacers.....Sept. 132
Heavy production machines....Sept. 132
Home appliances .....Sept. 134
Small electrical components....Sept. 136
Insulation—electrical and thermal Sept. 139
Bearings and gears .....Sept. 140
Refrigerator parts .....Sept. 142
Photographic equipment .....Sept. 144
Automotive applications .....Sept. 146
Textile machinery .....Sept. 149
Hydraulic components .....Sept. 150
Plastics, cellulosic .....May 85
Reference book sheet .....May 153
Plastics, decomposition of (abstract)... May 131
Plastics and rubber review ..... Jan. 114, Feb. 114, Mar. 104, Apr. 106 May 106, June 104, July 2, Aug. 3 Sept. 3, Oct. 3, Nov. 3, Dec. 3
Plastics show .....Nov. 153
Plastics used in fire control radar antenna .....Feb. 148
Polariscope, applying the.....Nov. 124
Polariscope for industrial use, simplified Sept. 124
Polarity indicator (abstract).....June 138
Polar recorder .....Feb. 108
Polystyrene (abstract) .....June 140
Powder metallurgy techniques, cost-reductechniques .....Apr. 152
Powder metallurgy technique, cost-reducing .....Feb. 134
Powdered metal parts, nonferrous...Oct. 107
Powders, nonferrous metal .....Sept. 102
Power shovel .....Jan. 96
Precision investment casting.....Apr. 81
Press, an actuated impact.....Dec. 98
Press, double acting intensifier for hydraulic .....Dec. 99
Press performance, analysis of.....Oct. 81
Pressure drop of gases and vapors flowing through pipes .....July 151
Productive capacity of machines (abstract) .....Aug. 128
Profile grinder with optical projection screen .....Nov. 150
Pump, air and liquid.....May 103
Pump, compact high pressure hydraulic July 102
Pumps, designs and operating principles pt. I Feb. 118, pt. II Mar. 108, pt. III Apr. 144
Punch assemblies, movable.....Dec. 100
Pyrometer measures rocket exhaust temperatures .....May 150

—Q—

Quality control is concern of product designer .....Apr. 160

—R—

Radiation, diamonds detect atomic Jan. 152
Radio telescope tops sounds of invisible stars .....Dec. 142
Recording oscillograph traces (abstract) Oct. 125
Recording stress level gage.....Jan. 138
Relays, magnetic latching.....Apr. 110
Research, peacetime benefits from military .....Jan. 81
Research in Britain sponsored by government .....Feb. 150
Research reactivated, commercial and university .....Jan. 155
Resin bonding of silicon steels in electrical laminated cores.....Nov. 85
Resistance heater, four station electric Sept. 90
Rotary contour formed parts.....Oct. 117
Rotary gear shaper.....May 92

—S—

Safety devices for nuts and bolts (abstract) .....July 140
Safety socket, non-shock .....July 101
Sandwich panels, flexural strength and stiffness of wood-aluminum....Aug. 104
Scale has three-piece plastic housing Aug. 98
Scheduling and control, engineering Dec. 102
Scrap to reduce cost, designing for low Apr. 150
Seals and internal and external slinger rings, ball bearing.....Oct. 110
Seals for ball and roller bearing applications, flange type.....Nov. 122
Selecting alloys to resist cavitation erosion .....Jan. 110
Semi-conductor replaces vacuum tubes Sept. 158
Sensitive adjustment for thermostat Oct. 103
Separator for dry materials, magnetic Aug. 100
Sheet metal spools—design and selection .....Nov. 143
Shock absorber orifice designs and equations, hydraulic....pt. I Feb. 92, pt. II Apr. 146
Comment .....Nov. 184
Shock mounting, vibration isolation and Sept. 86
Shock mounts, vibration and.....Oct. 112
Shock resistance, designing for....Jan. 140
Shop-run tolerances....pt. I May 142, pt. II June 141
Short bending members, over-strength of Nov. 110
Shovel, 40 cubic yard.....Dec. 90
Shower stall base redesign.....Aug. 97
Silicones, new plant answers demand for Aug. 146
Simplified polariscope for industrial use Sept. 124
Six ways to check vacuum in sealed containers .....Jan. 124
Slip rings and brushes for constant electrical resistance.....June 129
Solenoids, operating characteristics of industrial..pt. I July 86, pt. II Aug. 130
Sound projector.....Apr. 98
Speed-time analyzer.....Apr. 104
Spinning balls in water—one step in hydrodynamic research.....Sept. 116
Spools, design and selection of sheet metal .....Nov. 143
Spring redesign, formulas for.....Apr. 143
Correction .....July 184
Springs, applying torsion bar.....Oct. 104
Springs, nomogram for designing steel torsion .....Sept. 167
Springs, torsion bar .....Sept. 111
Stamped cover reduces breakage....Oct. 101
Stamping designs for economy in production, metal.....Sept. 122
Stamping forms water cooler top, steel Sept. 101
Stamping machine.....Mar. 98
Stamping, pressing and extruding operations, measurement of force required for (abstract).....June 136
Standard chosen as mercury 198 radiation wavelength, ultimate length Feb. 155
Standard tool plan adopted by NSRB Dec. 144
Standards for cadmium electroplate, thickness .....June 165
Standards for nickel electroplate, thickness .....Jan. 163
Standards for zinc electroplate, thickness June 167
Steel developments (abstract).....Feb. 135
Steel plates, notch toughness of....Feb. 110
Steels for anti-friction bearings (abstract) .....Oct. 121
Stove body made on standard dies..June 103
Strain tester for rubber.....Oct. 165
Strain testing improves iron alloy machine parts .....Aug. 116
Stress analysis, experimental (special section) .....Apr. 113
Brittle coating .....Apr. 116
Photoelasticity .....Apr. 122
Electric strain gages.....Apr. 126
Mechanical strain gages.....Apr. 134
Stress level gage, recording.....Jan. 138
Stress-relieving fillet curves, photoelastic investigation of.....May 138
Stud driver.....May 99
Submersible pump.....Jan. 108
Swiss designs for better coal utilization July 112
Synchronizer, engine .....Sept. 97

—T—

Take-ups, drives and idlers for belt conveyors, feeders.....Aug. 114
Tandem axle unit for truck trailers Aug. 96
Technical training in Germany not controlled, advanced.....Sept. 89
Tensile and elasticity testing of steel roller chain.....Sept. 121
Test methods, non-destructive.....July 129
Testing consumer products.....June 81
Testing highly stressed structures..Nov. 81
Testing, hydraulic system.....Dec. 115
Testing machine, giant Navy.....Dec. 143
Testing proves jet engine components, destructive .....Oct. 166
Thermosetting plastic laminates..pt. I Dec. 123
Thermostatic bimetal .....Sept. 106
Thickness standards for cadmium electroplate .....June 165
Thickness standards for nickel electroplate .....Jan. 163
Thickness standards for zinc electroplate .....June 167
Tin bronze, chill-cast (abstract)...Mar. 148
Tolerances, graphical representation of the Johansson system of machining Oct. 169
Torsion bar springs.....Sept. 111
Torsion bar springs, applying.....Oct. 104
Tractor engine designed for maintenance Aug. 102
Tractor, rear-engined .....Nov. 101
Trailer bodies .....June 102
Trailing electric cables, properties (abstract) .....July 139
Transfer machine.....Apr. 96
Transmission gear lubricating system Oct. 96
Transmission of direct current studied in Germany.....July 132
Trolley conveyor chain links and joints Jan. 122
Truck traction unit.....May 102
Tubing, chart for determining properties of round aircraft.....Sept. 165
Turbine cooling unit.....June 98

—V—

Vacuum cleaner has plastic parts, Hoover .....Oct. 94
Vacuum cleaner, Lewyt.....Mar. 92
Vacuum in sealed containers, six ways to check.....Jan. 124
V-belt drives, nomograph for designing high speed.....Dec. 155
Vibration and shock mounts.....Oct. 112
Vibration isolation and shock mounting .....Sept. 86

—W—

Washing machine, water power....Oct. 100
Water cooled resistor.....Apr. 102
Watthour meter.....June 96
Welded tubular steel structures, flanged joint for.....Nov. 117
Welding, aluminum and magnesium Apr. 149
Welding for the difficult-to-weld metals and alloys, Heliarc.....Jan. 127
Welding high-temperature alloys (abstract) .....Feb. 138
What kind of information does brittle coating give?..pt. I June 86, pt. II July 133
Why consider an adjustable speed drive .....Dec. 81
Wind speed indicator.....Apr. 101
Wiring for motor driven machines, electrical (special section).....May 113

—Z—

Zinc alloy for die casting (abstract) Apr. 156

CLASSIFIED INDEX

DESIGN ANALYSIS AND CALCULATIONS

Accelerations by vector methods in disk cam mechanisms ..... Dec. 128
Analysis of press performance .... Oct. 81
Applying the polariscope ..... Nov. 124
Bearing load, NBS finds straight line relation for estimating safe ..... Nov. 148
Bearings and lubrication for high-speed machinery ..... Dec. 108
Charts for calculating root stresses in spur gears ..... Feb. 161
Charts for designing long-short addendum spur gears ..... Mar. 167
Contact ratio charts for designing spur gears ..... Apr. 167
Design of structural components for interchangeability ..... Aug. 137
Determining dimensional relationships in complex parts ..... Dec. 133
Double enveloping right angle gear drives ..... Aug. 85
Engineering characteristics of 61S aluminum alloy sheet ..... June 108
Flexural strength and stiffness of wood-aluminum sandwich panels .... Aug. 104
Formulas for involute curve layouts Aug. 145
Formulas for spring redesign ..... Apr. 143
Correction ..... July 184
Fundamentals of noise..pt. I Feb. 131, pt. II Mar. 87, pt. III Apr. 137
Gear trains for multiple speeds .... Feb. 144
Gears, design factors for reduction (abtract) ..... Dec. 137
Graphical determination of gear contact ratios ..... Mar. 152
High accuracy contour cams ..... Aug. 134
Hydraulic shock absorber orifice designs and equations..pt. I Feb. 92, pt. II Apr. 146
Comment ..... Nov. 184
Journal bearings with diminishing oil supply ..... Nov. 104
Motion analysis, percentage charts for Oct. 171
Natural frequency calculations ..... Aug. 155
Nomogram for designing steel torsion springs ..... Sept. 167
Nomograph for designing high speed V-belt drives ..... Dec. 155
Nomograph for the square root of the sum of squares ..... Nov. 161
Overstrength of short bending members Nov. 110
Pivoted centrifugal friction clutches Feb. 140
Precision investment casting ..... Apr. 81
Pressure drop of gases and vapors flowing through pipes ..... July 151
Testing highly stressed structures ... Nov. 81
Thermostatic bimetal ..... Sept. 106
Torsion bar springs ..... Sept. 111
Torsion bar springs, applying ..... Oct. 104
Vibration and shock mounts ..... Oct. 112
Vibration isolation and shock mounting Sept. 86

ELECTRIC PARTS MOTORS AND CONTROLS

Adjustable-voltage control system..Feb. 127
Aircraft accessory systems ..... Nov. 119
Aircraft instrument design ..... Aug. 121
Applying special small motors for powering engineered products ..... Jan. 144
Control systems, positioning (abstract) Sept. 157
Curie temperature alloys ..... June 158
Drives for planers, electric (abstract) May 129
Electrical wiring for motor driven machines (special section) ..... May 113
Wiring diagrams and symbols ... May 115
Electrical conductors ..... May 120
Conduits ..... May 124
Cabinets and compartments ..... May 126
Magnetic latching of relays ..... Apr. 110
Metallized circuits ..... Apr. 141
Motor driven machines (special section) Mar. 113
Couplings and clutches ..... Mar. 116
Belt and chain drives ..... Mar. 117
Gear drives ..... Mar. 118
Hydraulic couplings ..... Mar. 118
Torque and horsepower ..... Mar. 120
Friction loads ..... Mar. 122
Bearings and lubrication ..... Mar. 123
Torque requirements to accelerate machines ..... Mar. 124
WR^2 of parts ..... Mar. 126
Load and thermal capacity of induction motors ..... Mar. 130
Polyphase squirrel-cage induction motors ..... Mar. 132
Speed-torque characteristics of polyphase wound-rotor motors..Mar. 136
Ratings for fractional horsepower motors ..... Mar. 137
Motors and controls for textile machinery (abstract) ..... Nov. 148
Non-destructive test methods ..... July 129
Operating characteristics of industrial solenoids..pt. I July 86, pt. II Aug. 130
Perforating machine ..... Mar. 100
Permanent magnet stability..pt. I Nov. 129, pt. II Dec. 113
Permanent magnets of sintered oxides Feb. 120
Resin bonding of silicon steels in electrical laminated cores ..... Nov. 85
Resistance heater, four station electric Sept. 90
Safety socket, non-shock ..... July 101
Semi-conductor replaces vacuum tubes Sept. 158
Slip rings and brushes for constant electrical resistance ..... June 129
Speed-time analyzer ..... Apr. 104
Thermostatic bimetal ..... Sept. 106
Why consider an adjustable speed drive Dec. 81

ELECTRONIC UNITS AND CIRCUITS

Coupling, high capacity eddy current Nov. 96
Electronic bin level indicator ..... June 99
Electronic micrometer uses dual coils (abstract) ..... Jan. 134
Shovel, 40 cubic yard ..... Dec. 90

ENGINEERING DEPARTMENT OPERATION

Cures for the troubles of the patent office Nov. 102
Designing with dollars ..... Mar. 81
Determining dimensional relationships in complex parts ..... Dec. 133
Dimensioning practice (abstract)..Oct. 123
Dry printing process operates electrostatically ..... Dec. 132
Engineering responsibilities in creating new products ..... Sept. 81
Engineering scheduling and control Dec. 102
Growth and influence of the engineering profession ..... May 81
Johansson system of machining tolerances, graphical representation of Oct. 169
Master control system ..... May 109
Patents and the engineer (special section)..pt. I June 113, pt. II July 113

FINISHES AND COATINGS

Effects of overheating aluminum determined by color of coating ..... July 104
Electrodeposited chromium, physical properties (abstract) ..... July 137
Electroless plating (abstract) ..... May 130
Evaluating the ideal industrial instrument finish ..... May 134
Finish application table ..... Jan. 161
Finishes for electroplated cadmium, adhesion of enamel (abstract) .... Dec. 138
Fire-retardant paints ..... Aug. 140
Finishing process information sheets, metal....pt. I Nov. 163, pt. II Nov. 165, pt. III Dec. 159
Thickness standards for cadmium electroplate ..... June 165
Thickness standards for nickel electroplate ..... Jan. 163
Thickness standards for zinc electroplate ..... June 167

HYDRAULIC AND PNEUMATIC CONTROLS

Aircraft accessory systems ..... Nov. 119
Air blast limits material flow ..... Dec. 95
Air motor, lightweight rotary ..... July 98
Air motors, crankless compressed..Nov. 95
Arbor press ..... May 100
Designs and operating principles of pumps..pt. I Feb. 118, pt. II Mar. 108, pt. III Apr. 144
Die casting machine ..... Jan. 102
Die truck ..... May 101
Dynaflow transmission, Buick ..... Feb. 96
Engine test control ..... Jan. 104
Fluid pressure drop losses through smooth straight tubing ..... Sept. 117
Hydraulic connecting rod ..... Mar. 95
Hydraulic control for sprinkler system Dec. 94
Hydraulic control system, high pressure ..... Sept. 93
Hydraulic power unit ..... Jan. 107
Hydraulic pump, compact high pressure ..... July 102
Hydraulic shock absorber orifice designs and equations..pt. I Feb. 92, pt. II Apr. 146
Comment ..... Nov. 184
Hydraulic surface grinder ..... Feb. 104
Hydraulic system ..... Apr. 95
Hydraulic system testing ..... Dec. 119
Oil well pumping system ..... Feb. 106
Paper cutter, hydraulic operation..Sept. 98
Power shovel ..... Jan. 96
Press, air actuated impact ..... Dec. 98
Press, double acting intensifier for hydraulic ..... Dec. 99
Pressure drop of gases and vapors flowing through pipes ..... July 151
Pump, air and liquid ..... May 103
Pump, compact high pressure hydraulic July 102
Shovel, 40 cubic yard ..... Dec. 90
Submersible pump ..... Jan. 108

LUBRICATION

Ball and roller bearings ..... Feb. 123
Ball bearing seals and internal and external slinger rings ..... Oct. 110
Bearing selection ..... Mar. 149
Bearings and lubrication for high-speed machinery ..... Dec. 108
High-temperature greases ..... Jan. 93
Hydraulic surface grinder ..... Feb. 104
Journal bearings with diminishing oil supply ..... Nov. 104
Methods of providing lubrication for gear systems ..... July 106
Transmission gear lubricating system Oct. 96

MATERIALS—METAL Ferrous

Age-hardening nickel alloys ..... Oct. 126
Air compressor ..... Mar. 99
Alloys for high creep strength (abstract) Jan. 132
Blower wheel ..... Jan. 106
Cast crankshafts, evaluation of (abstract) ..... Aug. 126
Chain saw ..... Mar. 102
Compressor housing ..... Feb. 103
Curie temperature alloys ..... June 158
Hot pressed formed parts for heavy construction ..... Nov. 113
Iron and steel review..Jan. 117, Feb. 116, Mar. 107, Apr. 109, May 108, June 106, July 4, Aug. 7, Sept. 3, Oct. 3, Nov. 3, Dec. 3
Light alloys need new design concepts July 81
Permanent magnet stability..pt. I Nov. 129, pt. II Dec. 113
Resin bonding of silicon steels in electrical laminated cores ..... Nov. 85
Selecting alloys to resist cavitation erosion ..... Jan. 110
Shovel, 40 cubic yard ..... Dec. 90
Steel developments (abstract) ..... Feb. 135
Steels for antifriction bearings (abstract) ..... Oct. 121
Thermostatic bimetal ..... Sept. 106
Welding high-temperature alloys (abstract) ..... Feb. 138

MATERIALS—METAL Nonferrous

Adjustable blade fan ..... May 95
Aluminum propeller blades and hub, extruded ..... Dec. 127
Beryllium reduces porosity of many materials ..... Dec. 136
Creep rate of various industrial leads (abstract) ..... Mar. 146
Curie temperature alloys ..... June 158
Engineering characteristics of 61S aluminum alloy sheet ..... June 108
Finishes for electroplated cadmium, adhesion of enamel (abstract) ..... Dec. 138
Flexural strength and stiffness of wood-aluminum sandwich panels .... Aug. 104
Forgings, toughness of (abstract)..Jan. 136
Hard metals uses (abstract) ..... Nov. 151
Hot pressed formed parts for heavy construction ..... Nov. 113
Light alloys need new design concepts ..... July 81
Magnesium alloy for high temperature application (abstract) ..... Apr. 153

Magnesium alloy progress (abstract) Mar. 148
Motor has aluminum housing.....May 101
Nonferrous metals review.....
Jan. 115, Feb. 116, Mar. 105, Apr. 107, May 107, June 105, July 2, Aug. 5, Sept. 3, Oct. 3, Nov. 3 Dec. 3
Nonferrous metal powders .....Sept. 102
Nonferrous powdered metal parts..Oct. 107
Permanent magnets of sintered oxides Feb. 120
Thermostatic bimetal .....Sept. 106
Tin bronze, chill-cast (abstract)....Mar. 148
Vacuum cleaner, Lewyt .....Mar. 92
Water cooled resistor.....Apr. 102
Welding high-temperature alloys (abstract) .....Feb. 138
Zinc alloy for die casting (abstract)..Apr. 156

MATERIALS—NON-METAL
Plastics and Rubber

Cellulosic plastics.....May 85
Reference book sheet .....May 153
Characteristics and configurations of reinforced plastic joints.....
pt. I May 104, pt. II June 134
Exposure meter, plastic.....May 98
Injection molding costs (abstract)..Nov. 150
Insulating and magnetic materials, properties (abstract).....Mar. 147
Laminates, comparison of low pressure (abstract) .....Jan. 137
Laminates, aircraft plastic (abstract) Dec. 140
Laminates, thermosetting (abstract) Apr. 157
Light fixtures, acrylic plastic (abstract) .....Oct. 122
Plastic resists high heat and corrosion Oct. 106
Plastic viewer .....Apr. 103
Plastics as engineering materials (special section) .....Sept. 129
Redesign of circuit breaker....Sept. 130
Colored plastic spacers.....Sept. 132
Heavy production machines....Sept. 132
Home appliances .....Sept. 134
Small electrical components....Sept. 136
Insulation—electrical and thermal Sept. 139
Bearings and gears .....Sept. 140
Refrigerator parts .....Sept. 142
Photographic equipment .....Sept. 144
Automotive applications .....Sept. 146
Textile machinery.....Sept. 149
Hydraulic components .....Sept. 150
Plastics, decomposition of (abstract) May 131
Plastics and rubber review Jan. 114, Feb. 114, Mar. 104, Apr. 106, May 106, June 104, July 2, Aug. 3, Sept. 3, Oct. 3, Nov. 3 Dec. 3
Plastics used in fire control radar antenna .....Feb. 148
Resin bonding of silicon steels in electrical laminated cores Nov. 85
Scale has three-piece plastic housing Aug. 98
Thermosetting plastic laminates.....
pt. I Dec. 123
Vacuum cleaner has plastic parts, Hoover .....Oct. 94

MATERIALS—NON-METAL
Miscellaneous

Finishes for electroplated cadmium, adhesion of enamel (abstract).....Dec. 138
Glass for high light intensity, heat resistant (abstract) .....Feb. 139
Fungicide for cork.....June 107
High temperature ceramics.....Mar. 110
High temperature greases.....Jan. 93
Slip rings and brushes for constant electrical resistance .....June 129

MECHANICAL MOVEMENTS AND MECHANISMS

Ball bat marker.....June 100
Ball valve, Venturi.....June 103
Bread wrapper .....Jan. 100
Cigarette merchandiser .....June 92
Designs and operating principles of pumps.....pt. I Feb. 118, pt. II Mar. 108, pt. III Apr. 144
Drilling machine .....Nov. 98
Drive mechanism, ingenious (abstract) Aug. 125
Electronic bin level indicator.....June 99
Feeders, take-ups, drives and idlers for belt conveyors.....Aug. 114
Four-bar linkages and typical industrial applications .....Dec. 106
Injection molding machine.....Mar. 96
Jack, two-speed mechanical.....Nov. 94
Marker, high speed.....Oct. 98
Meter adjustment, precision thread for frequency .....Dec. 96
Piston assembly machine.....Oct. 92
Polar recorder .....Feb. 108
Press, air actuated impact.....Dec. 98
Punch assemblies, movable.....Dec. 100
Rotary gear shaper.....May 92
Stamping machine.....Mar. 98
Stud driver.....May 99
Trolley conveyor chain links and joints Jan. 122
Watthour meter .....June 96
Wind speed indicator.....Apr. 101

MECHANICAL PARTS AND DRIVES

Accelerations by vector methods in disk cam mechanisms .....Dec. 128
Air motor, lightweight rotary.....July 98
Aluminum propeller blades and hub, extruded .....Dec. 127
Automotive heater .....Jan. 99
Backlash considerations when designing gears .....July 108
Ball and roller bearings.....Feb. 123
Ball bearing seals and internal and external slinger rings.....Oct. 110
Bearing selection .....Mar. 149
Bearings and lubrication for high-speed machinery .....Dec. 108
Blower control unit, variable speed..July 100
Bulldozer, 750 horsepower.....Nov. 90
Chart for determining properties of round aircraft tubing.....Sept. 165
Charts for calculating root stresses in spur gears .....Feb. 161
Charts for designing long-short addendum spur gears .....Mar. 167
Contact ratio charts for designing spur gears .....Apr. 167
Clutch, magnetic fluid.....May 145
Clutch, non-repeat safety.....Dec. 97
Coupling, high capacity eddy current Nov. 96
Designing for die casting.....Oct. 86
Double enveloping right angle gear drives .....Aug. 85
Dough mixer, variable ratio and speed for .....Oct. 102
Dry cleaning machine .....Apr. 92
Electrogyro vehicle .....Mar. 103
Embrittlement of roller chains by plating after assembly.....Sept. 105
Engineering developments in 1947..Feb. 81
Feeders, take-ups, drives and idlers for belt conveyors .....Aug. 114
Flange type seals for ball and roller bearing applications .....Nov. 122
Flanged joint for welded tubular steel structures .....Nov. 117
Flexible couplings for shafts.....Feb. 90
Formulas for spring redesign.....Apr. 143
Correction .....July 184
Gear motors based on unit design...June 153
Gears, design factors for reduction (abtract) .....Dec. 137
Graphical determination of gear contact ratios .....Mar. 152
Hack saw, modified Scotch yoke drive for .....Nov. 93
High accuracy contour cams.....Aug. 134
Journal bearings with diminishing oil supply .....Nov. 104
Magnetic filter unit.....May 103
Metal stamping designs for economy in production .....Sept. 122
Methods of providing lubrication for gear systems .....July 106
Motor driven machines (special section) Mar. 113
Motor, lightweight rotary air.....July 98
Nomogram for designing steel torsion springs .....Sept. 167
Nomograph for designing high speed V-belt drives .....Dec. 97
Nonferrous powdered metal parts..Oct. 107
Pivoted centrifugal friction clutches..Feb. 140
Plain sleeve bearings (special section) Oct. 129
Bearing performance factors...Oct. 130
Engine bearings—requirements..Oct. 134
Engine bearings—materials...Oct. 135
Engine bearings—current design..Oct. 129
Porous bearings .....Oct. 145
Wood bearings .....Oct. 147
Carbon-graphite bearings.....Oct. 147
Correction .....Nov. 150
Cast iron and steel bearings....Oct. 148
Plastic laminate bearings.....Oct. 149
Rubber bearings .....Oct. 151
Hydrodynamic bearings .....Oct. 152
Safety devices for nuts and bolts (abstract) .....July 140
Sheet metal spools—design and selection Nov. 143
Shovel, 40 cubic yard.....Dec. 90
Sound projector .....Apr. 98
Tensile and elasticity testing of steel roller chain .....Sept. 121
Torsion bar springs.....Sept. 111
Torsion bar springs, applying.....Oct. 104
Transfer machine .....Apr. 96
Truck traction unit.....May 102
Trolley conveyor chain links and joints Jan. 122
Vibration and shock mounts.....Oct. 112
Vibration isolation and shock mounting Sept. 86
Why consider an adjustable speed drive Dec. 81

PRODUCTION PROCESSES

Brazing by induction heating, designing for silver .....Aug. 109
Casting process licensed to American foundry, British .....Oct. 165
Casting steel continuously.....Oct. 161
Characteristics and configurations of reinformed plastic joints
pt. I May 104, pt. II June 134
Designing for die casting.....Oct. 86
Designing for low scrap to reduce cost Apr. 150
Economics of cabinet design.....Nov. 139
Economics of radio frequency heating Jan. 118
Electroforming difficult shapes.....Dec. 86
Electroforming parts with high strength (abstract) .....Mar. 145
Extruded aluminum doors.....June 95
Flanged joint for welded tubular steel structures .....Nov. 117
Gear tooth inspection method as an index of performance.....Feb. 87
Heliarc welding for the difficult-to-weld metals and alloys.....Jan. 127
Hot pressed formed parts for heavy construction .....Nov. 113
How brazing methods affect design of details .....Apr. 86
Metallized circuits .....Apr. 141
Metal stamping designs for economy in production .....Sept. 122
Mica splitter developed at Bureau of Standards, mechanical.....Dec. 163
Precision investment casting.....Apr. 81
Resin bonding of silicon steels in electrical laminated cores.....Nov. 85
Rotary contour formed parts.....Oct. 117
Sheet metal spools—design and selection Nov. 143
Shop-run tolerances.....
pt. I May 142, pt. II June 141
Stamping, pressing and extruding operations, measurement of force required for (abstract) .....June 136
Stove body made on standard dies..June 103
Trailer bodies.....June 102

PRODUCT DESIGNS

Adjustable blade fan.....May 95
Air blast limits material flow.....Dec. 95
Air compressor.....Mar. 99
Air conditioner control.....Oct. 97
Air motor, lightweight rotary.....July 98
Air motors, crankless compressed..Nov. 95
Alignment assured by split link....Sept. 101
Arbor press.....May 100
Automotive heater .....Jan. 99
Ball bat marker.....June 100
Ball valve, Venturi.....June 103
Blower control unit, variable speed July 100
Blower wheel .....Jan. 106
Bread wrapper .....Jan. 100
Bulldozer, 750 horsepower.....Nov. 90
Chain saw .....Mar. 102
Cigarette merchandiser .....June 92
Clutch, non-repeat safety.....Dec. 97
Compressor housing .....Feb. 103
Cooling jacket, tube.....Sept. 100
Coupling, high capacity eddy current Nov. 96
Creep tester .....May 96
Deadlock, automatic .....Dec. 101
Die casting machine.....Jan. 102
Die truck .....May 101
Dough mixer, variable ratio and speed for .....Oct. 102
Drill feed controlled by heated wires Aug. 101
Drill press turret, self-aligning.....July 101
Drilling machine .....Nov. 98
Dry cleaning machine.....Apr. 92
Dynaflow transmission, Buick.....Feb. 96
Electrogyro vehicle.....Mar. 103
Electronic bin level indicator.....June 99
Engine test control.....Jan. 104
Expansion chamber, exhaust system July 97
Exposure meter, plastic.....May 98
Extruded aluminum doors.....June 95
Fastener has stamped components..July 97
Flowmeter, two element.....Dec. 93
Gaging element, worm sectioned....July 96
Greyhound highway traveler.....Aug. 92
Grinding machine uses cam to control cycle .....Aug. 103
Hack saw, modified Scotch yoke drive for .....Nov. 93
Hot water heating system.....Sept. 94
Hydraulic connecting rod.....Mar. 95
Hydraulic control for sprinkler system Dec. 94
Hydraulic control system, high pressure Sept. 93
Hydraulic power unit.....Jan. 107
Hydraulic pump, compact high pressure July 102
Hydraulic surface grinder.....Feb. 104
Hydraulic system.....Apr. 95
Injection molding machine.....Mar. 96
Instrument gives sand moisture content July 95
Jack, two-speed mechanical.....Nov. 94
Leak detector .....Oct. 99
Loom, high speed cam operated....July 92

Magnetic filter unit.....May 103
Magnetic separator for dry materials Aug. 100
Marker, high speed.....Oct. 98
Meter adjustment, precision thread for frequency.....Dec. 96
Motorcycle has stamped frame.....July 103
Motor has aluminum housing.....May 101
Oil well pumping system.....Feb. 106
Paper cutter, hyddaulic operation..Sept. 98
Paper punch has welded stampings..Sept. 96
Perforating machine.....Mar. 100
Piston assembly machine.....Oct. 92
Plastic viewer.....Apr. 103
Polar recorder.....Feb. 108
Power shovel.....Jan. 96
Press, air actuated impact.....Dec. 98
Press, double acting intensifier for hydraulic.....Dec. 99
Pump, air and liquid.....May 103
Pump, compact high pressure hydraulic July 102
Punch assemblies, movable.....Dec. 100
Resistance heater, four station electric Sept. 90
Rotary gear shaper.....May 92
Safety socket, non-shock.....July 101
Scale has three-piece plastic housing Aug. 98
Sensitive adjustment for thermostat Oct. 103
Shovel, 40 cubic yard.....Dec. 90
Shower stall base redesign.....Aug. 97
Sound projector.....Apr. 98
Speed-time analyzer.....Apr. 104
Stamped cover reduces breakage...Oct. 101
Stamping forms water cooler top, steel Sept. 101
Stamping machine.....Mar. 98
Stove body made on standard dies June 103
Stud driver.....May 99
Submersible pump.....Jan. 108
Synchronizer, engine.....Sept. 97
Tandem axle unit for truck trailers Aug. 96
Tractor engine designed for maintenance Aug. 102
Tractor, rear-engined.....Nov. 101
Trailer bodies.....June 102
Transfer machine.....Apr. 96
Transmission gear lubricating system Oct. 96
Truck traction unit.....May 102
Turbine cooling unit.....June 98
Vacuum cleaner has plastic parts, Hoover.....Oct. 94
Vacuum cleaner, Lewyt.....Mar. 92
Washing machine, water power....Oct. 100
Water cooled resistor.....Apr. 102
Watthour meter.....June 96
Wind speed indicator.....Apr. 101

REFERENCE BOOK SHEETS

Chart for determining properties of round aircraft tubing.....Sept. 165
Charts for calculating root stresses in spur gears.....Feb. 161
Charts for designing long-short addendum spur gears.....Mar. 167
Contact ratio charts for designing spur gears.....Apr. 167
Finish application table.....Jan. 161
Johansson system of machining tolerances, graphical representation of Oct. 169
Metal finishing process information sheets.....pt. I Nov. 163 pt. II Nov. 165, pt. III Dec. 159
Motion analysis, percentage charts for Oct. 171
Natural frequency calculations....Aug. 155
Nomogram for designing steel torsion springs.....Sept. 167
Nomograph for designing high speed V-belt drives.....Dec. 155
Nomograph for the square root of the sum of squares.....Nov. 161
Pressure drop of gasses and vapors flowing through pipes.....July 151
Properties of cellulosic plastics.....May 153
Thickness standards for cadmium electroplate.....June 165
Thickness standards for nickel electroplate.....Jan. 163
Thickness standards for zinc electroplate.....June 167

RESEARCH AND TEST METHODS

Analysis of press performance.....Oct. 81
Applying the polariscope.....Nov. 124
Bearing load, NBS finds straight line relation for estimating safe.....Nov. 148
Calculator for guided missile computations, mechanical.....Nov. 151
Camera aids high speed studies, fastest Mar. 161
Compression tester.....June 151
Creep tester.....May 96
Designing for shock resistance.....Jan. 140
Effects of overheating aluminum determined by color of coating.....July 104
Engineering developments in 1947..Feb. 81
Evaluating the ideal industrial instrument finish.....May 134
Experimental stress analysis (special section).....Apr. 113
Brittle coating.....Apr. 116
Photoelasticity.....Apr. 122
Electric strain gages.....Apr. 126
Mechanical strain gages.....Apr. 134
Fastest motion pictures ever made..Apr. 164
Flowmeter, two element.....Dec. 93
Fundamentals of noise....pt. I Feb. 131, pt. II Mar. 87, pt. III Apr. 137
Formula reduces number of variables involved in creep.....Sept. 163
Hydraulic shock absorber orifice designs and equations pt. I Feb. 92, pt. II Apr. 146
Comment.....Nov. 184
Hydraulic system testing.....Dec. 119
Jet engine components, test laboratory for.....Nov. 150
Light alloys need new design concepts July 81
Neglected factors in the design of consumer products.....Aug. 81
Non-destructive test methods.....July 129
Non-destructive thickness gaging by x-ray successfully applied.....Mar. 158
Notch toughness of steel plates....Feb. 110
Overstrength of short bending members Nov. 110
Peacetime benefits from military research.....Jan. 81
Photoelastic investigation of stress-relieving fillet curves.....May 138
Pyrometer measures rocket exhaust temperatures.....May 150
Radiation, diamonds detect atomic..Jan. 152
Recording stress level gage.....Jan. 138
Research in Britain sponsored by government.....Feb. 150
Research reactivated, commercial and university.....Jan. 155
Selecting alloys to resist cavitation erosion.....Jan. 110
Simplified polariscope for industrial use Sept. 124
Six ways to check vacuum in sealed containers.....Jan. 124
Spinning balls in water—one step in hydrodynamic research.....Sept. 116
Strain tester for rubber.....Oct. 165
Strain testing improves iron alloy machine parts.....Aug. 116
Testing consumer products.....June 81
Testing highly stressed structures..Nov. 81
Testing machine developed for the Navy, giant.....Dec. 143
Testing proves jet engine components, destructive.....Oct, 166
What kind of information does brittle coating give? pt. I June 86, pt. II July 133

REVIEWS OF BOOKS

Aluminum and its applications.....May 173
Basic hydraulics.....Oct. 192
Blueprint language.....Feb. 149
Centrifugal and axial flow pumps..Sept. 184
Chemical process principles—part II, thermodynamics.....June 186
Chemistry and physics of organic pigments.....Mar. 186
Chemistry and technology of waxes May-176
College physics—part II.....Aug. 182
College technical physics.....Feb. 149
Color of life.....Apr. 187
Control charts.....Apr. 190
Control charts in factory management Jan. 149
Copper as an alloying element in steel and cast iron.....Oct. 188
Corrosion handbook.....May 178
Crankshaft design and manufacture..May 173
Design of machine elements.....Oct. 194
Design of metal cutting tools.....Sept. 186
Diary and sundry observations of Thomas A. Edison.....July 176
Electrical contacts.....May 176
Electric furnace design.....May 174
Electric resistance welding.....June 182
Electronic engineering patent index..Jan. 149
Electronic engineering principles..Apr. 192
Electronic instruments.....Sept. 190
Electronics for industry.....Nov. 176
Elementary differential equations..Mar. 184
Elementary mechanical vibrations..June 186
Elementary structural analysis....Sept. 188
Elements of magnetic tape recording and 999 applications.....May 174
Elements of nomography.....Aug. 175
Essentials of applied physics.....Jan. 149
Experimental stress analysis.....Mar. 184
Fan engineering.....Oct. 194
Finishes for aluminum.....Jan. 149
Fluid mechanics of turbomachinery June 188
Forming of austenitic chromium-nickel stainless steels.....June 184
Fractional horsepower electric motors Sept. 190
Frequency modulation, vol. I.....Aug. 174
Genius of industrial research.....Aug. 176
1947 Guidebook and directory for the metal finishing industries.....Mar. 187
Heat pumps.....Aug. 180
How to keep invention records.....Dec. 174
Hydraulics.....Sept. 186
Improving supervision.....June 182
Industrial applications of infrared..Feb. 149
Industrial electronics reference book..Oct. 190
Industrial health engineering.....July 176
Industrial management.....Apr. 196
Industries answeright.....July 174
Instrument and control manual for operating engineers.....May 173
Introduction to engineering plastics..Feb. 149
Introduction to mathematical statistics Nov. 175
Introduction to metallurgy.....Feb. 149
Introduction to the physics of metals and alloys.....Aug. 174
Introduction to tool engineering....Sept. 188
Laboratory manual in metallography..May 172
Light metals in structural engineering May 172
Lighting design.....Sept. 192
Magnetic control of industrial motors Mar. 186
Mallory vibrator data book.....Apr. 188
Manual of mathematics and mechanics Aug. 176
Marketing by manufacturers.....Oct. 190
Materials handbook.....July 168
Mechanical lubrication devices.....Aug. 182
Mechanics of machinery.....Oct. 194
Mechanics of materials.....Apr. 194
Metallurgical materials and processes Nov. 178
Metals and plastics.....June 190
Metals handbook, 1948 edition.....Nov. 180
Method-time measurement.....Nov. 174
Modern metallurgy of alloys.....Dec. 175
Modern plastics encyclopedia.....Dec. 174
Modern plywood.....Aug. 178
Molybdenum steels-irons-alloys.....Dec. 178
National electrical code handbook...Apr. 196
Nomography.....Nov. 178
Phenoplasts—their structure, properties and chemical technology.....Jan. 149
Photoelasticity, vol. II.....Aug. 178
Planning the product.....Dec. 176
Plastics dictionary.....June 183
Plating of zinc alloy die castings....July 172
Plywood, what it is—what it does..May 180
Powder metallurgy.....June 188
Powder metallurgy—its physics and production.....Apr. 194
Powder metallurgy, principles and methods.....May 172
Practical descriptive geometry.....Apr. 187
Practical job evaluation.....July 178
Practical theory of mechanisms....Jan. 149
Precision investment castings.....June 182
Precision workshop methods.....July 170
Pressure vessels for industry.....Apr. 190
Principles of jet propulsion.....Oct. 196
Principles of servomechanisms.....Nov. 175
Proceedings of the Society for Experimental Stress Analysis.....Sept. 185
Process engineering.....Nov. 174
Professional registration, laws and the engineer.....Nov. 182
Radiant heating.....July 178
Rempe engineering data book.....Apr. 188
Rome cable manual.....Apr. 190
Science and engineering of nuclear power May 176
Science of plastics, vol. I.....May 178
Shot peening.....Apr. 188
Solid luminescent materials.....Oct. 189
SPI handbook.....Mar. 187
Standard welding symbols.....July 170
Steel and its heat treatment, vol. I, II Apr. 192
Steel plates and their fabrication....July 172
Stress analysis and design of elementary structures.....Aug. 175
Supercharging the internal combustion engine.....Dec. 176
Symposium on paint and paint materials Aug. 175
Technical descriptive geometry.....Oct. 189
Techniques in experimental electronics Dec. 175
Television, vol. III, IV.....Apr. 187
Theory and application of radio-frequency heating.....Feb. 149
Theory of limit design.....Apr. 186
Tool steel simplified.....June 183
Torque converters or transmissions..May 180
Tungsten, A.C.S. Monograph No. 94..Feb. 149
Vacuum tubes.....June 190
Vibration and sound.....Sept. 184
Waterbury's handbook of engineering July 168
Wear and lubrication of piston rings and cylinders.....Oct. 188
What electronics does.....May 174

STANDARDS AND STANDARDIZATION

Non-destructive thickness gaging by x-ray successfully applied.....Mar. 158
Standard chosen as mercury 198 radiation wavelength, ultimate length Feb. 155
Standard tool plan adopted by NSRB Dec. 144
Thickness standards for cadmium electroplate.....June 165
Thickness standards for nickel electroplate.....Jan. 163
Thickness standards for zinc electroplate.....June 167

TECHNICAL ABSTRACTS

Air traffic control systems.....Feb. 137
Alloys for high creep strength.....Jan. 132
Cast crankshafts, evaluation of....Aug. 126
Control systems, positioning.....Sept. 157
Creep rate of industrial leads.....Mar. 146
D-C power sources for machine tools Sept. 154
Dimensioning practice.....Oct. 123
Drive mechanism, ingenious .....Aug. 125
Drives for planer, electric.....May 129
Dynamometer for small motor measurements, precision.....May 132
Electric power and American industry Sept. 156
Electrodeposited chromium .....July 137
Electrodeposited copper-tin alloy....May 133
Electroforming parts with high strength Mar. 145
Electroless plating .....May 130
Electronic micrometer uses dual coils Jan. 134
Finishes for electroplated cadmium, adhesion of enamel.....Dec. 138
Forgings, toughness of .....Jan. 136
Gating systems for metal casting..Aug. 129
Gears, design factors for reduction..Dec. 137
Glass for high light intensity, heat resistant .....Feb. 139
Hard metals uses.....Nov. 151
Heat of food.....May 131
Injection molding costs.....Nov. 150
Insulating and magnetic materials..Mar. 147
Laminates, comparison of low pressure Jan. 137
Laminates, aircraft plastic.. .....Dec. 140
Laminates, thermosetting .....Apr. 157
Laminating and coating, continuous June 140
Liquid rheostat design.....June 139
Magnesium alloy for high temperature application .....Apr. 153
Magnesium alloy progress.....Mar. 148
Metric system, adopt the.....Sept. 153
Motors and controls for textile machinery .....Nov. 148
Plastic light fixtures, acrylic.....Oct. 122
Plastics, decomposition of.....May 131
Polarity indicator.....June 138
Productive capacity of machines..Aug. 128
Recording oscillograph traces.....Oct. 125
Safety devices for nuts and bolts...July 140
Stamping, pressing and extruding operations, measurement of force required for .....June 136
Steel developments .....Feb. 135
Steels for anti-friction bearings.....Oct. 121
Tin bronze, chill cast.....Mar. 148
Trailing electric cables, properties..July 139
Welding high-temperature alloys..Feb. 138
Zinc alloy for die casting.....Apr. 156

AUTHORS' INDEX

ASHKINAZY, S. B.—Resin bonding of silicon steels in electrical laminated cores .....Nov. 85
BARIFFI, Herbert F.—Pivoted centrifugal friction clutches.....Feb. 140
BARTENBACH, Herman—Six ways to check vacuum in sealed containers Jan. 124
BASTIEN, Carl J.—Vibration isolation and shock mounting.....Sept. 86
Vibration and shock mounts....Oct. 112
BASTOW, Donald—Torsion bar springs Sept. 111
Applying torsion bar springs..Oct. 104
BATH, Cyril J.—Rotary contour formed parts .....Oct. 117
BEECHING, R.—Selecting alloys to resist cavitation erosion .....Jan. 110
BELING, Geert—Designing for shock resistance .....Jan. 140
BENTIVOGLIO, Marie—Cellulosic plastics .....May 85
Reference book sheet .....May 153
BIRTCH, F. E.—Double enveloping right angle gear drives.....Aug. 85
BLACK, George — Thickness standards for nickel electroplate.....Jan. 163
Thickness standards for cadmium electroplate .....June 165
Thickness standards for zinc electroplate .....June 167
Fire-retardant paints.....Aug. 146
Metal finishing process information sheets—pt. I Nov. 163, pt. II Nov. 165, pt. III Dec. 159
BLU, M. A.—Testing consumer products June 81
BOCK, A. P.—Economics of radio frequency heating .....Jan. 118
BODENSCHATZ, A. — Formulas for spring redesign .....Apr. 142
correction .....July 184
BOOKMILLER, Wayne H.—Charts for calculating root stresses in spur gears .....Feb. 161
Charts for designing long-short addendum spur gears.....Mar. 167
Contact ratio charts for designing spur gears .....Apr. 167
BRADLEY, D. C.—Nonferrous metal powders .....Sept. 102
Nonferrous powdered metal parts Oct. 107
BRANDT, Mulford M.—Engineering responsibilities in creating new products .....Sept. 81
BREWER, Given A.—Analysis of press performance .....Oct. 81
BROWN, Joseph—Hydraulic shock absorber orifice designs and equations ....pt. I Feb. 92, pt. II Apr. 146
BROWNSHIELD, Martin — Neglected factors in the design of consumer products .....Aug. 81
BUCCOLA, Charles H.—Determining dimensional relationships in complex parts .....Dec. 133
CADY, Edwin Laird—Precision investment casting .....Apr. 81
CANDEE, Allan H—Formulas for involute curve layouts.....Aug. 145
CAPEK, L. E.—Die casting.....Oct. 86
CARLIN, Benson—Non-destructive test methods .....July 129
CHAPMAN, Everett—Photoelastic investigation of stress-relieving fillet curves .....May 138
CHATTLER, Leo M.—Hydraulic system testing .....Dec. 119
CLOUGH, Ray W.—Simplified polariscope for industrial use.....Sept. 194
Applying the polariscope.....Nov. 124
COLLIER, John T.—Metallized circuits Apr. 141
COOK, C. D.—Fungicide for cork..June 107
CURTIS, Frank W.—Designing for silver brazing by induction heating..Aug. 109
DAVIS, J. Burgess—Engineering responsibilities in creating new products Sept. 81
DeDOMENICO, S.—How brazing methods affect design of details....Apr. 86
DEMAREST, Millard—Cellulosic plastics May 85
Reference book sheet.....May 153
DeSHAZER, Grant A.—Flanged joint for welded tubular steel structures.Nov. 117
DAVIES, Charles—Cabinet design...Nov. 139
DIDSZUNS, Fritz—Magnetic latching of relays .....Apr. 110
Di TIRRO, Domenic A.—Fluid pressure drop losses through smooth straight tubing .....Sept. 117
DODGE, Louis—Gear trains for multiple speeds .....Feb. 144
DUDLEY, D. W.—Graphical determination of gear contact ratios.....Mar. 152
DURELLI, A. J.—What kind of information does brittle coating give? pt. I June 86, pt. II July 133
DUTEE, Francis J.—Slip rings and brushes for constant electrical resistance .....June 129
FOX, Zola—Finish application table Jan. 161
FRANCIS, Richard J.—Characteristics and configurations of reinforced plastic joints .....
pt. I May 104, pt. II June 134
FULMER, H. M.—Applying special small motors for powering engineered products .....Jan. 144
GREGOIRE, J. A.—Light alloys need new design concepts.....July 81
HARDING, Watson G.—Protecting machine parts with dust excluder boots Nov. 134
HARDY, Howard C.—Fundamentals of noise....pt. I Feb. 131, pt. II Mar. 87, pt. III Apr. 137
HARDY, H. M.—Strain testing improves iron alloy machine parts.....Aug. 116
HARRINGTON, Robert—Fungicide for cork .....June 107
HAYTHORNE, P. A.—Effects of overheating aluminum determined by color of coating .....July 104
HAZELETT, S. R.—Natural frequency calculations .....Aug. 155
HERBST, H. T.—Heliarc welding for the difficult-to-weld metals and alloys Jan. 127
HOLLIDAY, T. B.—Aircraft instrument design .....Aug. 121
Aircraft accessory systems....Nov. 119
HOWARD, Ernest R.—Thermostatic bimetal .....Sept. 106
HOWARTH, H. A. S.—Journal bearings with diminishing oil supply....Nov. 104
HUCKERT, Jesse—Accelerations by vector methods in disk cam mechanisms .....Dec. 128
JONES, J. E.—Adjustable-voltage control system .....Feb. 127
KEMP, Richard H.—Slip rings and brushes for constant electrical resistance .....June 129
KEYSER, A. H.—Evaluating the ideal industrial instrument finish....May 134
KIRTLAND, Gravson D.—Engineering scheduling and control.....Dec. 102
KORFF, Walter H.—Extruded aluminum propeller blades and hub.....Dec. 127
KORN, Arthur H.—Pressure drop of gases and vapors flowing through pipes .....July 151
KUIVINEN, T. O.—Strain testing improves iron alloy machine parts.Aug. 116
LANGHAAR, Henry L. — Flexural strength and stiffness of wood-aluminum sandwich panels.....Aug. 104
LEWIS, K. D.—Nomograph for designing high speed V-belt drives.....Dec. 155
McCALEB, E. F.—Designing for low scrap to reduce cost.....Apr. 150
McCONVILLE, H. A.—High-temperature greases .....Jan. 93
McLAUGHLIN, R. W.—Bearings and lubrication for high-speed machinery .....Dec. 108
MALLETT, Frank McL.—Design of structural components for interchangeability .....Aug. 137
MARTIN, L. D.—Gear tooth inspection method as an index of performance Feb. 87
Backlash considerations when designing gears .....July 108
MEIER, J. H.—Recording stress level gage .....Jan. 138
MILLER, Roy A.—Flexural strength and stiffness of wood-aluminum sandwich panels .....Aug. 104
MILLER, W. B.—Testing highly stressed structures .....Nov. 81
MILLS, Wallace C.—Sheet metal spools —design and selection.....Nov. 143
NACHOD, Carl P.—Nomogram for designing steel torsion springs..Sept. 167
Nomograph for the square root of the sum of squares.....Nov. 161
NIELSEN G.—Die casting.....Oct. 86
NIELSEN, L. M.—Shop-run tolerances pt. I May 142, pt. II June 141
O'BRIEN, Eugene W.—Growth and influence of the engineering profession May 81
OCHSNER, Frederick C.—Age-hardening nickel alloys.....Oct. 126
OLCOTT, E. L.—High temperature ceramics .....Mar. 110
OSTLIND, Benjamin—Chart for determining properties of round aircraft tubing .....Sept. 165
OTTEY, Herbert A.—Hot pressed formed parts for heavy construction....Nov. 113
PHILLIPS, Franklyn W.—Slip rings and brushes for constant electrical resistance .....June 129
PILIA, F. J.—Heliarc welding for the difficult-to-weld metals and alloys Jan. 127
PREISLER, J. J.—Resin bonding of silicon steels in electrical laminated cores .....Nov. 85
PRINE, W. H.—Electroforming difficult shapes .....Dec. 86
REIBEL, Sidney—Trolley conveyor chain links and joints.....Jan. 122
ROSS, H. R.—Percentage charts for motion analysis .....Oct. 171
RULEY, Bryce T.—Ball and roller bearings .....Feb. 123
Bearing selection .....Mar. 149
RYDER, Frederick L.—Overstrength of short bending members.....Nov. 110
SANDELL, B. E.—Designing for die casting .....Oct. 86
SANDERS, Howard — Fire - retardant paints .....Aug. 140
SAVAGE, John—Master control system .....May 109
SCHOR, Harold — Peacetime. benefits from military research.....Jan. 81
Engineering developments in 1947 Feb. 81
SCHMID, John H.—Flexible couplings for shafts .....Feb. 90
SCHMITTER, W. P.—Gear motors based on unit design.....June 153
SCHWARTZ, E. H.—Testing highly stressed structures .....Nov. 81
SHAW, John—Curie temperature alloys June 158
SKOW, Norman A.—Thermosetting plastic laminates.....pt. I Dec. 123
SNYDER, H. C.—Designing for die casting .....Oct. 86
SQUIRE, A.—How brazing methods affect design of details.....Apr. 86
STUDDERS, R. J.—Permanent magnets of sintered oxides.....Feb. 120
Permanent magnet stability pt. I Nov. 129, pt. II Dec. 113
TOULMIN, H. A., Jr.—Patents and the engineer (special section) pt. I June 113, pt. II July 113
Cures for the troubles of the patent office .....Nov. 102
UNDERHILL, Charles R.—Operating characteristics of industrial solenoids pt. I July 86, pt. II Aug. 130
VAN HAMERSVELD, John—Designing with dollars .....Mar. 81
WALKER, R. C.—Recording stress level gage .....Jan. 138
WARGA, Joseph J.—Engineering characteristics of 61S aluminum alloy sheet .....June 108
WILEY, H. B.—Effects of overheating aluminum determined by color of coating .....July 104
WINDENBURG, D. F.—Notch toughness of steel plates.....Feb. 110
WOODHOUSE, Harold—Johansson system of machining tolerances...Oct. 169
YAVNE, R. O.—Contour cams.....Aug. 134